

## STANDARD 2-RIPARIAN/WETLANDS

*Riparian and wetland vegetation have structural, age, and species diversity characteristic of the state of channel success and is resilient and capable of recovering from natural and human disturbance in order to provide forage and cover, capture sediment, dissipate energy, and provide for ground water recharge.*

Riparian zones are the interfaces between terrestrial and aquatic ecosystems. As ecotones, they encompass sharp gradients of environmental factors, ecological processes, and plant communities (Gregory et.al., 1991). Riparian/wetland habitat makes up a very small percentage of the Lower Platte River Report Area. Although this is a very small area, these important communities are some of the most productive found on public lands. They are important for recreation, fish and wildlife habitat, water supply, cultural and historic values, as well as livestock production. The discussion of riparian/wetland habitat will be divided into two geographic regions, upper elevation perennial streams (including the Platte River) and lower elevation ephemeral streams.

### 1) Characterization:

Riparian-wetland habitat within the assessment area are described in the following groups: desert springs and seeps, and streams supported by them; snow supported seeps, springs and streams that flow out from the higher mountains; numerous impoundments for recreational fisheries and/or irrigation, man-made wetlands around artesian wells. Streams in this assessment area generally flow perennially in the higher elevations and support riparian vegetation. At lower elevations they flow intermittently before turning into dry ephemeral drainages that do not support riparian vegetation. Riparian grassland habitat types are the most common form of vegetation, but also include several willow riparian shrublands, aspen/spruce riparian woodlands, and cottonwood woodlands. Riparian grasslands are wetland, stream, or spring-associated grass and grass-like communities, which are maintained by water tables within rooting depth during most of the growing season. Willow riparian shrublands occur as scattered individuals or as denser communities, on wet sites that are somewhat thermally protected along drainages. Aspen riparian woodlands occur in deep, loamy soils on north and east aspects where snow drifts protect and support their moisture requirements. Cottonwood woodlands occur along drainages leaving the Medicine Bow Mountains and line the Platte River.

Lower elevation seeps and springs primarily support riparian grassland habitat types (photo 16-1). Common species include Nebraska, beaked and Liddon' sedges, Baltic rush, spike-sedge, tufted hairgrass, basin wildrye, wheatgrass, saltgrass, Kentucky bluegrass, redbud, mat muhly, alkali sacaton, cinquefoil, horsetail, plantain, mint, aster and thistle. Streams may flow for short distances or for several miles from these sources. Examples within the assessment area include: Miller Creek, Emigrant Creek, LaMarsh Creek, and Deadman Creek. Some seeps have had reservoirs or pits constructed below them, described under the man-made wetlands section.

The seeps, springs and streams in the higher elevations support a mixture of riparian grassland and willow riparian shrubland habitat types (photo 16-2). Riparian grassland species are generally the same as those listed above. The willow riparian shrubland is dominated by Geyer, Booth, sandbar, and yellow willows. Additional shrubs found here include dogwood, waterbirch, currant, snowberry, rose, and individual quaking aspen. The herbaceous understory generally includes Nebraska sedge, beaked sedge, tufted hairgrass, Kentucky bluegrass and redbud. The main drainages are Upper Sage Creek, Jack Creek, Rattlesnake Creek, Pass Creek, Lake Creek, Oberg Creek, Headwaters Creek and the North Platte River. Streams are diverse in both gradient and flow regimes, which creates greater diversity in vegetative communities and species composition. Adjacent to these habitats are cottonwood, aspen and in some cases aspen/spruce riparian woodlands. These sites closer to the mountains occur on north to east facing slopes adjacent to springs, streams or ponds, typically at 6,000 to 8,100 ft. Soils are generally poorly-drained and water tables are within root depth during most of the growing season. Overstory species are aspen, willow, spruce and limber pine. The shrub layer is more open than the willow riparian sites and is dominated by serviceberry, chokecherry, common juniper, currants, rose and big sagebrush. Other species

associated with this habitat type are shrubby cinquefoil, tufted hairgrass, Columbia needlegrass, elk and other sedges, bluegrasses, wildrye, rushes, and various forbs in the herbaceous layer. At middle and higher elevations quaking aspen can also be added to this listed, and where abundant, these sites are classified as aspen riparian woodlands. Cottonwood riparian woodlands are found on higher gradient and sometimes drier sites along the Platte River. Understory species include many of those already listed above, with a tendency towards those shrubs and herbaceous plants that like drier meadow habitats.

The remaining portion of the basin consists of intermittent to ephemeral drainages, and include Little Sage Creek, Miller Creek, Trapper, Rasmussen Creeks, St. Mary's and associated tributaries. Where water is more reliable, usually tied to springs or snowmelt these areas may support riparian habitat. As water becomes more limiting they do not support wetland vegetation nor do they have hydric soils. Hydric soils are formed when there are at least two weeks of water saturation during an average year, which produces anaerobic conditions within the soil.

There are several man-made wetlands within the assessment area, some provide recreational fisheries, while others are primarily for irrigation. Teton and Rim Lake Reservoirs are developed recreation sites with facilities (photo 17-1). Emigrant Reservoir is a less developed recreational fishery, but is still very popular. Little Sage Reservoir, Arrowhead Reservoir and many other small ponds provide important waterfowl habitat during wet years and support riparian grassland and open aquatic-emergent wetland habitat. Vegetation must be tolerant of salt and/or alkaline conditions, especially in the lower elevations. Common plant species include Nuttall's alkaligrass, alkali cordgrass, saltgrass, Baltic rush, cattails, tufted hairgrass, American bulrush, slim sedge, greasewood, arrowgrass, alkali plantain, sea milkwort, buttercup, cinquefoil, hairy goldaster, and Rocky Mountain glasswort.

Other man-made reservoirs include Rasmussen (Johnson) Reservoir, Kindt Reservoir, Sage Creek Reservoir, etc. which provide important storage for irrigation water. Due to the extreme fluctuations in water levels, riparian vegetation is extremely limited to non-existent.

Other types of manmade wetlands occur next to artesian wells. Wetlands supported by artesian wells occur on both upper tributaries of Miller Creek (photo 17-2). Sedges, rushes and grasses are the most commonly occurring species.

#### Evaluation Method:

The primary method used in evaluating this standard is through a qualitative assessment procedure called Proper Functioning Condition (PFC). This process evaluates physical functioning of riparian/wetland areas through consideration of hydrology, vegetation, and soil/landform attributes. A properly functioning riparian /wetland area will provide the elements contained in the definition:

- Dissipate stream energy associated with high water flows, thereby reducing erosion and improving water quality
- Filter sediment, capture bedload and aid floodplain development
- Improve flood-water retention and ground water recharge
- Develop root masses that stabilize streambanks against cutting action (TR 1737-15 1998)

It is important to note that the PFC assessment provides information on whether an area is physically functioning in a manner that allows maintenance or recovery of desired values (e.g., fish habitat, neotropical birds, or forage) over time. PFC is not desired or future condition (TR 1737-15 1998). PFC assessments are used along with other existing information such as stream cross-sections, photo-points, and habitat assessments to evaluate this standard of rangeland health.

## **2) Issues and Key Questions:**

The area has been in official drought status since 2000 and has had several years of extremely low precipitation. How have these drier conditions impacted longterm many of the riparian/wetland areas in the S&G area?

Livestock use of riparian habitats has been and continues to be an important factor relating to riparian condition within the assessment area.

Noxious and invasive weeds along creeks, reservoirs, hay meadows and especially the North Platte River is the most important factor relating to riparian condition within the assessment area. How will the spread of these weeds be addressed, especially in complex land ownership patterns? (The weeds issue will be also be addressed in Standard 4)

Historic livestock grazing use that included trailing large numbers of livestock and much longer durations of use, trapping beaver out of the system, and the lack of upland water sources contributed to the decline in riparian conditions. Current livestock grazing use is negatively impacting establishment and/or production of woody riparian plant species such as willows, dogwood, waterbirch or cottonwood in some portions of the watershed. Movement of animals through riparian areas can affect functionality by increasing bare ground, usually observed in the form of trails and crossings. Higher numbers or an increased duration of use will create a greater impact from bank shear and trampling, leading to more bare ground. Increased bare ground reduces the ability of the system to function properly in high flow events. In many cases, best management practices have been implemented which reduce the duration and/or change the season of grazing use for livestock. Continued refinement of these practices will address the current livestock grazing use aspect.

There are certain areas within the assessment areas where hummock areas occur adjacent to riparian areas. Many of these are a factor of the soil involved and the historic long duration of livestock use that has occurred within the area. Will implementation of best management grazing practices address these areas at risk?

Vertical instability is a problem in some areas. Some of these headcuts have been stabilized within the watershed; however, there are still areas that need to be addressed or maintained. Manmade structures such as reservoirs also have instability problems due to naturally fine sediments and lack of pipes on older projects. Cutting of the spillways on reservoirs or around or through dikes are ongoing problems affecting functionality. What is practical to address these instability issues?

Another factor affecting riparian condition is roads and their associated impacts on these areas. Roads that are directly adjacent to riparian systems in many cases channel sediments directly into creeks and reservoirs. In addition, improper size or placement of culverts can increase erosion directly into riparian systems. If the amount of sediment is high enough, it can reduce vegetation, reduce functionality, decrease water quality, and change the channel dynamics. Roads can also interrupt surface and subsurface flow, which can effectively change the type of riparian system from one side to the other. Can road related concerns be addressed through culverts, improved crossings, rerouting, water bars, and roadside pits or are there additional solutions that can be implemented?

### **3) Current Conditions**

PFC assessments have been conducted in the watershed since the mid 1990s, with the most recent assessments occurring in 2002. Documentation of riparian condition in addition to PFC may include photo-points, channel cross-sections, ground-water wells, habitat quality assessments, and woody plant studies.

The assessment area has been in official drought status since 2000 and has had several years of low precipitation. These drier conditions have impacted many of the riparian/wetland areas in the S&G area. Wetland areas in the assessment area are fed by groundwater or by created water sources, therefore impact to these features is generally delayed and can be expected in the following years. The riparian/wetland areas around the mountains tend to flow from a combination of groundwater and snowmelt. Many of these riparian areas have had much lower flows

overall, and even in some cases have stopped flowing earlier than usual. In addition, the drought has made a significant difference in some wetland areas, where normally perennial reservoirs have dried up (photo 19-1).

Livestock grazing over the last few years has been reduced by grazing permittees due to drought conditions. However, with less water available many of these wetland/riparian areas have been less productive and may show signs of drought stress. Assessments for PFC have been completed from the late 1990's until 2003, with several areas (at least along Sage Creek) that have been reassessed. Reassessments of many of these areas were dictated by national policy, however, separate monitoring and additional information shown improved condition, generally moving from as extreme as non-functional and functioning-at-risk with a downward trend to functioning-at-risk upward trend due to implementation of BMPs.

## **LENTIC SYSTEMS**

Lentic systems within the assessment area are primarily manmade. These include larger reservoirs for fisheries and/or irrigation, isolated springs and seeps, wells that have artesian flows, some of which have been fenced to protect wetland vegetation and provide water sources for livestock and wildlife using troughs outside the fencing. The natural water sources have been used seasonally by livestock and year-round by wildlife, resulting in high amounts of trampling and utilization with changes or loss of species composition. Changes in species composition include increases in undesirable (from a forage point of view) species such as Baltic rush and arrowgrass; increased amounts of grazing resistant species like Kentucky bluegrass and mat muhly; greater amounts of early successional forbs like strawberry cinquefoil and dandelion; and almost total loss of vegetative cover (Percy Spring). However, the isolated nature of some of these wetland habitats may mask impacts from management changes.

The current condition of Rim Lake and Emigrant Reservoir are meeting proper functioning guidelines in accordance with their capability and potential. Banks are generally stable and vegetated with native species where capable are already listed in the characterization section for this Standard. Although Emigrant is not excluded from grazing, short duration use has ensured healthy riparian vegetation alongside the reservoir where water fluctuation is not excessive. Other smaller sites meeting this standard have been fenced in the past for protection from grazing use, and include Arrowhead Lake. Many of the other manmade reservoirs do not meet minimal standards due to weeds including Teton, Lower Sage, Kindt, and Rasmussen which also is impacted by water level fluctuations.

For example, in the Home Ranch allotment, Elk Mountain Ranch has excluded Arrowhead Lake to promote health of the riparian area. Fencing to keep cattle and/or bison out has resulted in a remarkable recovery of herbaceous vegetation. (photo 19-2).

Lentic sites in the mountains area include natural lakes, and a few smaller man-made reservoirs. These sites have good species composition (already described) and bank cover, and are in proper functioning condition.

### ***Lentic areas not meeting PFC that are livestock related:***

Dana Meadows South allotment:

Percy Spring is one of the few perennial water sources within this allotment. It was originally developed and piped to the Percy Corral. A few years ago the permittee attempted to fence it with electric, but was completely unsuccessful. Cattle tore down the fence due to the desirability of both the forage and the limited water sources (photo 19-3). Last year, due to the PFC assessment, the permittee in conjunction with NRCS, and BLM supplied materials, redeveloped the spring and excluded livestock. Recovery should be rapid, as there were still lingering riparian plants around the spring. There are a few additional lentic areas within the allotment that need to be addressed to meet this standard (photo 19-4).

#### Pass Creek Ridge allotment:

There are a few limited riparian areas within this allotment that do not meet PFC minimum standards. Efforts to protect these areas by fencing is ongoing (photo 20-1, 20-2). This allotment has been used from 4/15 to 10/31 with year-round use for horses. However, use generally consists of turning out the first of May and removing the cattle in mid September.

#### Sixteenmile allotment-

Winter pastures within this allotment passed the riparian standards. Spring/summer/fall pastures had certain areas that did not pass this standard including portions of Separation Creek (photo 20-3). Fencing and additional water development has been planned to reduce grazing duration.

#### Platte River allotment-

Long durations of use by cattle during the growing season has negatively impacted a spring source on Second Cottonwood Draw (photo 20-4). Management to shorten this duration and protect the lentic area is proposed.

#### Middlewood Hill allotment-

The headwaters of Beaver Creek on public land are not currently meeting riparian standards. Reintroducing fire into the landscape and livestock management adjustments are ongoing. An enclosure had been constructed at the spring sites, but is in poor shape. Plans are being made to redesign and repair this enclosure.

#### **LOTIC SYSTEMS:**

Perennial streams include the upper portions of Sage, Lake, Pass, Cow, Rattlesnake and Jack Creeks, and the North Platte River. The numerous creeks that originate in the mountains, are diverse and support grassland, shrubland and woodland riparian plant communities. Beaver are common in certain areas (photo 20-5), in other areas old remnants of old dams and gnawed off aspen trees are still visible reminders of their presence. The loss of aspen habitat to conifer succession will be discussed in Standard #3 – Upland Plant Communities. Beaver can still be found, but often in private land irrigated meadow areas. The processes that occur with the hydrologic modification by beaver are natural, so many areas in stages of readjustment are normal under these influences. Most of the gradient readjustment and revegetation of dams and ponds that comes after the beaver have gone has occurred. However, in a few locations this process can still be observed. Most streams have good species composition and stability, due to the deep-rooted sedges, grasses and willows, which dominate these sites. Woody plant communities are diverse in species composition and vertical structure, with good regeneration of young plants where good management is in place. Near the edge of the mountains the amount of hedging on young shrubs and trees is higher, and may be attributable to more frequent use by big game species. In general, many of these streams meet proper functioning condition. Little to no bare ground, channel sloughing, or instability in these systems is present today, with the exception of a few isolated areas. However, some changes to meet desired future condition should still occur, such as greater cover or age class structure of a particular grass, shrub or tree.

In Sage Creek allotment, aspen and willow riparian communities still exist which support beaver populations in some locations. This particular area was originally rated as Functioning-At-Risk with a downward trend in 1998 and has greatly improved since that time as documented by other monitoring. Factors identified that contributed to the original rating were long durations of livestock use, and gradient adjustments due to loss of beaver ponds. In the lower elevation portion of Sage Creek there have been erosional control structures to stabilize the stream. Vigorous sedge and rush communities, with willows stabilize the majority of this drainage. The majority of the streambanks are lined with both obligate and facultative riparian plants that are capable of holding together the riparian area even in high flows. These plants have deep and extensive root systems that stabilize the channels and

also play an important part in channel roughness during high flows and filtration of sediments. Regeneration of woody shrubs and trees is occurring with a mixed age class and vertical structure of plants.

Along Jack Creek at the southern end of this assessment area there was a livestock working facility alongside the creek. In cooperation with the Saratoga-Encampment-Rawlins Conservation District and federal partners, Kelley Land and Cattle relocated their pens to a nearby upland. That action positively impacted water quality and the riparian habitat where the corrals had been. Improvements in condition were rapid and the creek channel stabilized within a couple of years.

#### **Intermittent and Ephemeral drainages**

In the lower elevations of this analysis area, riparian communities consist of mainly intermittent and ephemeral drainages. These communities vary from riparian herbaceous-dominated to coyote willow-dominated to an absence of riparian vegetation of any kind. In many cases, these systems are higher in alkalinity, and plant communities must be adaptive to that condition.

Along the intermittent portion of Sage Creek and other lower elevation drainages, significant improvement has occurred. Willows have expanded greatly along the length of this stretch as have the sedges, rushes and cattails. Those areas that are small locations around a seep-type water source are described under “Lentic” areas. The majority of the lowest portion of the assessment area are ephemeral with no riparian vegetation.

#### ***Lotic areas not meeting PFC that are livestock related:***

##### **Wolfe Allotment-**

This allotment has a short portion along Pass Creek that is used as a watering site when water is available is rated as non-functioning (photo 21-1). In addition, major fluctuations of irrigation water returning to Pass Creek greatly impacts this area. Possible solutions may include: fencing the riparian area on public while providing a water gap, developing a pipeline to provide more reliable water and better distribution of use, or pumping out of Pass Creek to an offsite tank. There may be other solutions that will also address this extremely limited area of public land.

##### **Sixteenmile allotment-**

Winter pastures within this allotment passed the riparian standards. Spring/summer/fall pastures had certain areas that did not pass this standard including portions of Separation Creek (photo 21-2). Fencing and additional water development has been planned to reduce grazing duration.

#### **4) Reference Conditions:**

Reference conditions are also described under Standard 1. In “The Bridger Pass Overland Trail 1862-1869”, the country around Elk Mountain was described as follows: “Beautiful grass covered meadows and slopes that were fed by several small streams, and near-by tree covered mountains—all abounding in deer, elk, antelope, bear and mountain sheep.” From the same source, the Sage Creek stage stop which is actually located on Miller Creek is “out in the middle of a large, dry, open desert flat...The stream is dry part of the year.” Riparian vegetation is specifically identified in “The Wyoming Landscape 1805-1878...Willow, birch, and hawthorn were found on a branch of Rattlesnake Creek...the streams emerging from the Medicine Bow Mountains were clothed with cottonwood, aspen and juniper.” The Bryan Wagon Survey described the North Platte as a “beautiful mountain stream flowing over large stones, pebbles, and gravel. The bottom was several hundred yards wide with good grass and abundant firewood from the many cottonwood trees.” In addition, during the early 1800’s it was noted that beaver dams were common throughout the area.

#### **5) Synthesis and Interpretation:**

Due to the more favorable conditions alongside the mountain ranges, several homesteads were developed. These areas were productive hay meadows that provided a base operation for livestock grazing. Originally, there were both sheep and cattle operations. Many permittees (Palm's and Vivion's were large sheep operations) ran multiple herds of sheep that trailed from the lower elevations along the Platte River all the way up to summer sheep grounds on the National Forest. Sheep operations have been converted to cattle, and therefore have changed significantly the way these lands are managed today.

Areas within the checkerboard allowed livestock operators to lease the private land grazing rights from the Union Pacific railroad and essentially control the grazing on the vacant public lands intermingled with their private lands. These areas came under the management of a single livestock operator far earlier than the land used by multiple stockmen, resulting in better condition and management of the land they could treat as their own.

An important natural element in riparian and wetland habitats that is seen are beaver. Beaver are considered hydrologic modifiers in the PFC process. This means they can directly affect stability of those systems that have a woody component. Their dams often provide gradient control on steeper slopes, extend the streamflow period later into the year, and create more diverse vegetation and wildlife habitat. Loss of aspen habitat, trapping, and browsing of aspen and willow by cattle and elk has contributed to the reduction in beaver. There is more than adequate willow-waterbirch riparian habitat along some streams to support beavers. However, they seem to prefer irrigated hay meadows that leads to their removal via trapping. Long-term improvement in the aspen communities, which is discussed in Standard #3, would result in expanding beaver populations and the positive impacts they can have on riparian and wetland systems.

Following the Taylor Grazing Act, grazing districts were established and priority rights for grazing determined. In addition to fencing of private allotments, it also led to adjustments in stocking rates and AUMs available for livestock use to maintain or improve range conditions. When addressing livestock management issues over the last twenty years, it has not been necessary to reduce livestock numbers to achieve resource (primarily riparian) objectives. Depending on the specific situation, best management practices for livestock grazing have been implemented on a case-by-case basis in the majority of the watershed. In some cases, many practices and improvements needed to be implemented. In others, just a slight adjustment was needed.

In addition to adjusting duration and season of use by livestock in riparian areas, additional water sources have helped to greatly improve riparian areas. Upland water developments such as spring developments, reservoirs, and pipelines reduce the dependence of livestock on riparian habitats and result in better distribution of the animals in a pasture (photo 22-1, 22-2). Specifically, spring developments protect the water source, improve water quality and flow, and provide greater flexibility in grazing rotations. In some cases, pastures with riparian habitat are either used early or deferred to late summer or fall use.

Vegetation treatments, prescribed burning and herbicide applications, also improve distribution of both livestock and wildlife, while diversifying upland shrub communities and age classes. These treatments also increase water recharge into the overall riparian system resulting in higher and longer duration of flows. In some cases, springs may start to flow that hadn't prior to treatment. To date, use of treatments within the assessment area has been fairly limited, occurring along Bridger Pass, Little Sage Creek, Smith and Hugus Draw and on Miller Hill.

Fencing has been used to reduce duration of grazing on riparian habitats within most allotments. For the most part, there are few exclosures (besides spring/seep developments) within the basin (picture 39-1). Managing livestock use across the watershed by strategic placement of fences and other improvements has resulted in decreased grazing duration on riparian communities overall without the need for exclusion, complete rest, or decreasing AUMs.

The principle impacts of livestock management upon the condition of riparian-wetland habitat, are long duration of use (two months up to all summer) and hot-season use (primarily late June through early September). Historic

(long-term) livestock use in this manner has led to many of these areas being dominated by upland grass species such as Kentucky bluegrass, redtop, and mat muhly that are adapted to drier riparian zone areas and increase because of heavier grazing use. Upland forbs and grass species resistant to grazing consequently increased along stream channels. These species may endure overgrazing but provide very little riparian stability. They have shallow roots that are not capable of stabilizing soils adjacent to riparian areas especially in high flows. With only upland species protecting the streambank, bank sloughing, bare ground, and vertical cutting were commonly observed results. Platts et al. (1987) states that the highest rating for streambank alteration is when less than 25 percent of the streambank is false, broken down, or eroding. Where BMPs for livestock grazing have been implemented, riparian herbaceous communities have responded quickly. Early successional plants such as spike-sedge, brookgrass and creeping potentilla respond initially by increasing in bank cover and encroaching into the stream channel. Then sedges, rushes and desired grasses begin to expand and later dominate the riparian community. Shortening duration of use, frequency of use, and timing of use has resulted in a vigorous, productive and, most importantly, stable vegetative communities.

Examples of two allotments where more intensive management has been implemented are described below:

### **Bolten/Pine Grove**

The Overland Trail Cattle Company LLC, has greatly improved livestock grazing management since 1997 when they obtained the deeded lands linked to the Bolten and Pine Grove allotments. A grazing management plan was developed by TOTCO in 2000 and approved by the Rawlins Field Office. This provides for a well managed grazing program for the allotment. They originally had 21 pastures and now have more than 45 to provide maximized flexibility. In addition, actions taken include:

- Treated over 5000 acres of mature to decadent sagebrush stands
- Drilled/developed 70 wells and over 30 miles of pipeline
- Developed 18 springs
- Built or repaired 11 reservoirs and 9 diversions

In addition, permittee established monitoring in cooperation with BLM has been ongoing for several years in all the pastures of the operation. Because of these projects and changes in livestock management riparian and upland vegetation communities have improved. Willows, wild rye and sedge communities have responded dramatically to the shorter duration of use in this allotment. Channel stability and bank cover along perennial and intermittent to ephemeral drainages has benefitted throughout. Woody species including dogwood, waterbirch and currant are more common as are a higher diversity of herbaceous riparian vegetation. A documented example of the improvements to riparian condition is Upper McKinney Creek. Although Upper McKinney Creek is in the Muddy Creek Watershed it is located within the Bolten/Pine Grove allotment. After changes in grazing management and associated range improvements it was taken off the State of Wyoming's 303d list of impaired streams.

Overland Trail has also obtained the Sage Creek allotment which has ongoing projects including; fencing, vegetation treatment, reservoir repair and 3-5 spring developments.

### **Home Ranch**

The Elk Mountain Ranch Company LLC, has operated in the Home Ranch allotment since 1994. A Rangeland Management Plan was developed by Elk Mountain and approved by the Rawlins Field Office in 1999. Woven wire fence was removed and replaced by high-tensile electric fence to create over thirty pastures, allowing a rotation whereby the same pasture is not grazed at the same time each year. Monitoring by a private consultant (in cooperation with BLM) has been conducted since Elk Mountain Ranch became responsible for this allotment. Ground cover values have maintained over the last six years, even after prolonged drought due to improved management. All riparian areas rated PFC, and many were determined to meet desired future condition in relation to herbaceous and woody composition and health. Riparian and upland improvement is a continued objective for this area and has been demonstrated through timing and management of grazing. The ranch also has a conservation easement with The Nature Conservancy, and monitors timber health (on private and public), macroinvertebrates, wildlife herds, etc.



## 6) Recommendations:

There has been a tremendous improvement in riparian/wetland condition within the assessment area over the last 10 years, however, there are still some specific areas that need attention. Allotments containing riparian/wetland habitat that do not meet this standard have been described previously and include: Dana Meadows South, Wolfe, Pass Creek Ridge, Platte River, Middlewood Hill, and Sixteenmile allotments. For riparian systems along streams and creeks, lotic systems, only those portions of streams and creeks that have riparian on BLM land were included. The non-riparian lengths and portions of streams and creeks not on BLM land were not assessed. For the Lentic values, the total acres of waterbodies and wetland features were calculated. For example a lake with a portion of the shore line as wetland was tallied for the entire portion of the lake that could exhibit open water or wetland characteristics.

Many of the lentic and lotic sites not meeting the standard have been, or are in the process of being addressed in management plans or as range improvement projects. Continued progress in grazing management of livestock (and bison) will ensure further improvement of all riparian areas within this area. Although there are areas where desired future condition is yet to be reached in woody species dominance and composition, these areas still meet the minimum standard of rangeland health. Other than the specific allotments listed previously, the remainder of the allotments within this assessment area are meeting Standard #2 – Riparian/Wetland.

Specific recommendations are:

Continue to implement or manage using BMPs for livestock grazing. This primarily means controlling the season, duration, and distribution of livestock use to meet desired resource objectives for riparian habitats. Specific dates and timing of use must be determined on a case-by-case basis. Methods to achieve this include, but are not limited to: herding, additional fencing, water developments, and vegetation treatments. Address trespass livestock problems where needed.

Continue existing projects to protect riparian habitat and provide off-site water for livestock and bison.

Identify and correct impacts from improved roads, including water flows and erosion into riparian systems. Two-tracks that are negatively impacting riparian areas should be identified and addressed.

In areas where produced water from CBM development occurs, manage the placement of new water sources to meet livestock and wildlife management objectives. Where possible, create new water sources to maintain beneficial uses from CBM discharged water. Plan for reclamation of reservoirs and channels that receive CBM resources when discharge ceases. Make sure CBM water management plans meet the livestock and wildlife management goals for individual areas.

Plantings may be undertaken where needed within the watershed. Species diversity and vertical structure of wetland and riparian communities can be easily enhanced through vegetative plantings. When just a few individuals are planted, they establish exceedingly well.

Continue to expand the beneficial practices that improve riparian condition and maximize public involvement and education regarding resource issues.